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Demonstration of Antibodies.—Collodion pellets, prepared by the method described by Cannon and Marshall, were coated with Old Tuberculin. With these sensitized pellets the author was able uniformly to demonstrate the presence of antibodies against tuberculin in the blood serum of rabbits inoculated with tubercle bacilli, even when complement-fixing antibodies and skin-sensitivity to tuberculin were not demonstrable.—*Technic for Demonstrating Antibodies against Tuberculin in Experimental Animals with Sensitized Collodion Pellets, J. M. Weir, Proc. Soc. Exper. Biol. & Med., January, 1941, 46: 47.*—(*F. B. S.*)

Blood Proteins in Tuberculosis.—Using the Tiselius electrophoresis technique, it was found that the percentage of albumin in rabbit serum decreased with progression of tuberculosis. The first change in the globulins in early tuberculosis was usually a rise in the percentage of alpha-globulin and the appearance of a small amount of a component with a mobility slightly greater than albumin. These changes are probably evidence of sensitization to tuberculin protein. The beta-globulin in all cases increased as the disease reached the terminal stage. There was some evidence that a rise in the gamma-globulin may accompany resistance to the disease.—*Electrophoretic Study of the Blood Protein Response in Tuberculosis, Florence B. Seibert & J. W. Nelson, J. Biol. Chem., March, 1942, 143: 29.*—(*F. B. S.*)

Antibody to Tuberculin Protein.—By means of the Tiselius electrophoresis technique it was shown that the alpha-globulin fraction in rabbit serum increases during sensitization with tuberculin protein. Furthermore, it decreased to some extent when the specific precipitate formed by adding antigen to the immune serum was removed, indicating the tuberculin protein antibody is in this serum component.—*Electrophoretic Identification of Antibody to Tuberculin Protein, F. B. Seibert & J. W. Nelson, Proc. Soc. Exper. Biol. & Med., January, 1942, 49:* 77.—(*F. B. S.*)

Immunity in Tuberculosis.—The mechanism of the increased resistance to reinfection in tuberculosis is still uncertain. The increased rapidity of the mobilization of mononuclear phagocytes at the site of invasion of the parasite, which characterizes the response of the immune as contrasted with that of the normal animal, has been recently shown to be a function of a heightened physiological activity conferred on these cells by the tuberculous process. This heightened activity also expresses itself by an increased phagocytic capacity for tubercle bacilli and for a variety of particulate substances. Tubercle bacilli are also more readily phagocyted *in vitro* by mononuclears derived from actively tuberculous animals than by those obtained from normal animals. Whether the observed failure of bacilli of reinfection to grow within the mononuclears of the immune animal is also an expression of the altered physiological activity of these cells is the subject of the present study. The very fact that the "immune" cells have increased phagocytic powers for tubercle bacilli is no explanation for the

failure of bacilli to grow within them, for normal mononuclears abundantly phagocytose bacilli, and it is precisely within the cytoplasm of normal phagocytes that the bacilli multiply. An endeavor was made to determine whether phagocytic mononuclears of immunized animals, removed from the influence of the organs in which they are naturally situated, will inhibit the growth of tubercle bacilli in their cytoplasm more effectively than similar cells obtained from normal animals. It was also undertaken to ascertain to what extent the inhibition of growth of tubercle bacilli in the immunized animal is due to the cells themselves and to what degree it is accounted for by the immune body fluids which bathe them. To answer these questions the anterior chambers of normal albino rabbits were used as *in vivo* incubators. One anterior chamber was host to one type of cell or cell-serum mixture, while the other anterior chamber of the same rabbit was host to a cell type or a cell-serum mixture to which the first was to be compared. The fate of the bacilli in each cell type and in each fluid menstruum was culturally determined by comparing the number of living bacilli present in the cells originally implanted with the number of bacilli that were contained in these cells after they had grown in the chambers. The implanted cells were identified by carbon particles that had been ingested by these cells at the same time that the bacilli were phagocyted. *Results:* (*1*) Mononuclear phagocytes of immunized animals that had ingested tubercle bacilli *in vivo* and had subsequently been transplanted and grown in the environment of a normal animal continue to inhibit the multiplication of the microörganism in their cytoplasm in the absence of immune body fluids. (*2*) Mononuclear phagocytes of immunized animals that had ingested tubercle bacilli *in vitro* in the presence of immune serum inhibit the multiplication of the microörganism in their cytoplasm to a much greater extent than cells of normal animals that had ingested the bacteria in the same medium and had grown in a similar environment. (*3*) The presence of immune serum during the *in vitro* ingestion of tubercle bacilli by mononuclear phagocytes of normal animals does not regularly endow them with increased bacteriostatic properties for the microörganism. Whether or not continued sojourn of normal cells in immune body fluids will confer upon them such properties has not been determined. (*4*) Mononuclear phagocytes of immunized animals that had ingested tubercle bacilli *in vitro* in a medium of normal serum and had subsequently grown in an environment devoid of immune body fluids inhibit the multiplication of the microörganism in their cytoplasm to a much greater extent than do normal cells under the same conditions. (*5*) Active tuberculosis confers on the mononuclear phagocytes themselves increased bacteriostatic properties for the tubercle bacillus which are independent of the immune body fluids or of the organ environment in which they grow. It would appear that the failure of bacilli to grow in reinfected animals rests chiefly on this increased capacity of their mononuclear phagocytes (with two plates).—*Studies on the Mechanism of Immunity in Tuberculosis. The Fate of Bacilli Ingested by Mononuclear Phagocytes Derived from Normal and Immunized Animals, M. B. Lurie, J. Exper. Med., March, 1942, 75: 247.*—(*J. S. W.*)

Mobility Velocity of Histiocytes.—The mobility velocities in an electrical field of histiocytes obtained from normal guinea pigs showed a trend to a higher rate than did those from guinea pigs inoculated with the H37 strain of tubercle bacillus. Statistically the difference was significant. These findings may indicate a difference in surface charge.—*Mobility Velocities of Histiocytes from Normal and from Sensitized Guinea Pigs, M. C. Kahn, Proc. Soc. Exper. Biol. & Med., April, 1941, 46: 635.*—(*F. B. S.*)

Phagocytized Tubercle Bacilli.—Histiocytes of normal guinea pigs are in many instances capable of exerting at least bacteriostatic properties toward engulfed human type tubercle bacilli when phagocytosis occurs *in*

vivo. The peritoneal exudates of 32 guinea pigs were used and 4,198 washed histiocytes were planted on 101 tubes of Corper's egg medium. Of these histiocytes only 1,513, or 34.8 per cent, had engulfed tubercle bacilli. Growth of the bacilli was obtained on only 2 slants, whereas, when comparably small numbers of free tubercle bacilli were seeded on the same medium, growth was obtained in 28.8 per cent of the tubes. No fragmentation of the bacteria within the histiocytes was observed and therefore the bacteriostatic action exerted may be possibly explained as due to a disturbance in the metabolism of the engulfed tubercle bacilli.—*Bacteriostatic Properties of Histiocytes toward Mycobacterium Tuberculosis as Determined by the Single Cell Method, M. C. Kahn, Proc. Soc. Exper. Biol. & Med., April, 1941, 46: 630.*—(*F. B. S.*)

Sulfadrugs in Experimental Tuberculosis.—The inhibitory action of 23 sulfonamides, sulfones and related phosphorus compounds on the human tubercle bacillus was tested with graded concentrations of the various drugs in glycerine broth. The effective inhibiting concentrations of 4-4′ diaminodiphenylsulfoxyde and of 4-4′ diaminodiphenylsulfone were found to be 3 resp 2 mg. per cent. Sulfathiazol inhibited at the level of 5 mg. per cent and diaminodiphenylsulfide, sulfadiazine and phosphanylic acid were effective at concentrations of 10 mg. per cent. Several other compounds including promin and sulfapyridine were active at concentrations of 20 mg. per cent. Sulfanylamide was among the drugs that required higher concentrations. With 8 of the drugs therapeutic tests were done in guinea pigs infected intraperitoneally with human bacilli and in rabbits infected intravenously with a bovine strain. The guinea pigs were treated orally. Incorporation of the drugs in the diet was not found satisfactory and the drugs were eventually administered intragastrically. The rabbits were injected intravenously. The treatment was started immediately after inoculation and was continued for one month. Favorable results both as regards survival time and retardation of the disease were obtained with diaminodiphenylsulfone, promin and sulfadiazine. In general the results were somewhat better in the guinea pigs than in the rabbits. A doubtful effect was obtained with sulfathiazol and with bis (dimethyldiaminophenyl) phosphinous acid. Phosphanylic acid was poorly absorbed from the gastrointestinal tract and left the blood stream rather rapidly on intravenous or subcutaneous injection. This made the maintenance of a satisfactory blood level difficult and the results were irregular. With promin and sulfidiazine the favorable results were accomplished with a dosage well within the tolerated range (0.5 g. per kg.). A close parallelism was found between *in vivo* and *in vitro* experiments. In both instances diaminodiphenylsulfone was found to be the most effective agent. It has a definitely retarding effect if administered in 70 to 75 per cent of the lethal dose. It is suggested that this drug be used as a standard of comparison in the search of derivatives capable of producing the same or better effects with dosages further removed from the toxic level. Promin does not fulfill this requirement though it appears to be a step in the right direction.—*The Action of Certain Sulfonamides, Sulfones and Related Phosphorus Compounds in Experimental Tuberculosis, M. I. Smith, E. W. Emmart & B. B. Westphal, J. Pharmacol. & Exper. Therap., February, 1942, 74: 163.*—(*A. B. T.*)

Tuberculosis in the Cotton Rat.—The Eastern cotton rat is more susceptible to infection with pathogenic bovine tubercle bacilli than the albino rat and less than the guinea pig. Like the albino rat, the tuberculous cotton rat is insensitive to skin-test doses of tuberculin, and tolerates large amounts injected subcutaneously. The tubercles were predominantly epithelioid in type, some showing caseation, but no giant cells were observed. The tubercles were conglomerated and acid-fast bacilli were easily demonstrated.—*Experimental Tuberculosis in the Cotton Rat (Sigmodon nispidus littoralis), M. M. Stein-*

bach & C. J. Duca, Proc. Soc. Exper. Biol. & Med., May, 1940, 44: 288.—(F. B. S.)

Treatment of Experimental Tuberculosis.—The authors have previously proved experimentally that the administration of "promin" could inhibit totally or partially the development of tuberculosis in animals subsequently inoculated. A second experiment was carried out to determine the effect of promin on the development of the disease in animals already inoculated. Eighty guinea pigs were inoculated with lethal doses of human tubercle bacilli. These were divided into eight groups for comparative study, including one untreated control group, the other seven groups varying in the time of administration of the drug. In all the control animals widespread visceral tuberculosis developed. The last animal of the control group died one hundred and eighty-nine days after inoculation. At this time 57 (84 per cent) of the treated animals were living and apparently well. Of the 11 that had died prior to this time, none had grossly detectable visceral tuberculosis. At necropsy it was not possible to detect any gross lesions of tuberculosis in 41 (60 per cent) of the 68 treated animals. In 24 of the remaining 27 animals the grossly visible lesions were limited to tiny nodules in the subcutaneous tissue at the site of inoculation, to involved regional lymph nodes or to both. Only 3 treated animals (4 per cent) had sufficient residual tuberculosis to be detected grossly in the viscera. Microscopical examination of treated animals demonstrated evidence of preëxisting or inactive tuberculosis in 40 (59 per cent) of the 68 treated animals. The lesions observed were of types rarely seen in guinea pigs. Caseation necrosis was absent. Fibrosis was frequently observed, sometimes with encapsulation of the lesions. Partial or complete calcification was occasionally noted, which was surprising in view of the relatively short duration of the disease. The fact that, where observed, the tuberculous disease was restricted greatly in distribution, was reduced in quantity in all instances and was altered in character to a striking degree, was regarded as evidence that chemotherapy had been successful in restraining the disease and in prŏducing retrogressive changes in the lesions. The authors and their associates have treated more than 75 human patients with various infections, including various forms of tuberculosis, with promin, and will later publish the results. The only serious toxic effect noted has been the development of haemolytic anemia, but this is only after oral administration.—*Treatment of Experimental Tuberculosis, H. C. Hinshaw & W. H. Feldman, J. A. M. A., September 27, 1941, 117: 1066.—(G. L. L.)*

N′Dodecanoylsulfanilamide and Sulfapyridine in Tuberculosis.—Guinea pigs inoculated with human type tubercle bacilli (H37) were treated orally with N′dodecanoylsulfanilamide in olive oil, or sulfapyridine in oil, or sulfapyridine in oil and vitamin C subcutaneously. No significant decrease in tuberculosis over control untreated guinea pigs was seen at autopsy.—*N′Dodecanoyl-sulfanilamide, and Sulfapyridine Plus Vitamin C in Experimental Tuberculosis in Guinea Pigs, M. M. Steinbach & C. J. Duca, Proc. Soc. Exper. Biol. & Med., May, 1940, 44: 133.—(F. B. S.)*

Intrapleural Tuberculosis.—Pleuritis induced in rabbits by injection of talc into the pleural space increased the spread of later intrapleural tuberculous infection. The authors, therefore, suggest the danger of this treatment in human beings for the purpose of producing adhesions.—*Intrapleural Tuberculosis following Talc Pleuritis, E. Bogen, J. J. Singer & N. Hiatt, Proc. Soc. Exper. Biol. & Med., February, 1942, 49: 302.—(F. B. S.)*

Respiratory Function Tests.—Studies of respiratory function are of practical importance in medico-legal work and in selecting and applying the various forms of collapse therapy. The spirometer of Knipping, usually used for such tests, is expensive and at present not obtainable. The essential differ-

ences between it and the Benedict-Boulitte apparatus for determination of the basal metabolic rate are three. Its bell is twice as large. It has an electric pump to move the air in such a way as to eliminate respiratory effort. Its revolving drum has two speeds instead of one, the faster being used for detailed analysis of individual respiratory cycles. An ordinary closed-circuit apparatus constructed for metabolism determinations can be used for study of respiratory function since (*1*) its smaller volume does not interfere, provided test periods do not exceed one minute, (*2*) the electric pump is unnecessary if the bell moves easily and (*3*) the two-speed drum is not really essential for practical work. Using the metabolism apparatus, tests are made on fasting subjects. The dorsal decubitus is the preferred position. The apparatus is filled with air and the subject allowed to breathe normally for two half-minute periods, the bell being refilled to its original level with oxygen before the second period. The minute respiratory volume is found by multiplying the number of respirations in one minute by the length of the excursion of the pen and by the surface area of the base of the bell. The rate of oxygen consumption is determined in the usual manner from the slope of the tracing. Next the maximum period of voluntary apnoea is recorded, following 3 or 4 maximal respirations. Using a concentration of about 50 per cent oxygen, the minute volume of respiration, the oxygen consumption, the maximum voluntary apnoea, and the vital capacity are again determined. This last is tested, first, by starting with a full inspiration and having the patient expel as much air as possible and, second, after a rest period, starting with a complete expiration and having the patient take a maximal inspiration followed immediately by a maximal expiration. Both methods are repeated several times until consistent results are obtained. Next the maximal minute respiratory volume is recorded by having the subject breathe as deeply and rapidly as possible for not more than thirty seconds, to avoid the unpleasant effects of hyperventilation. The difference between this value and the normal minute respiratory volume represents the respiratory reserve. A normal person uses the same amount of oxygen, breathing air as when breathing pure oxygen. If a defective arterialization exists, more oxygen is used when pure oxygen is respired.—*Recientes adquisiciones para el estudio funcional del aparato respiratorio, Primera comunicación: Técnica de su estudio, F. D. Gómez, J. L. Vilar del Valle & G. Echagüe, Jr., Hoja tisiológica, September, 1941, 1: 177.*—(*H. B. S.*)

Widening of Mediastinum.—One of the most striking features of primary tuberculous infection in children is enlargement of the paratracheal, tracheobronchial and associated lymph nodes that drain the primary pulmonary focus of infection. This enlargement of the lymph nodes about the hilum of the lung may be recognized roentgenologically in many cases. Very often the roentgenological shadow of the mediastinum may appear abnormally wide only because of an improper technique in taking the roentgenograms. Roentgenograms which are taken in expiration or in the anteroposterior direction with the patient in the supine position will in children show an apparent widening of the mediastinum. This is due to the fact that displacement of the mediastinal structures posteriorly takes place when the patient is in a supine position. As a consequence the mediastinal structures spread laterally and will show widening of the mediastinal shadow. To a lesser degree the same appearance will be seen in roentgenograms that are taken in the postero-anterior direction with the patient in the supine position. Furthermore in expiration the heart and mediastinal shadow will similarly be wider than in deep inspiration. Therefore it is believed that a true evaluation of the mediastinal shadow in children can be made only by a study of roentgenograms taken in the postero-anterior direction with the patient in an upright position.—*Study of the So-called "Widened" Mediastinum in Tuberculous Infants and*

Children, A. V. Shapiro, Quart. Bull. Sea View Hosp., October, 1941, 7: 56.—(A. A. E.)

Pleural Effusion.—Primary pleural effusion is generally thought to be a manifestation of tuberculosis. A survey was therefore made to determine the incidence of pulmonary tuberculosis following idiopathic pleural effusion. Two hundred and fourteen patients were studied. None of these cases had apparent tuberculosis elsewhere in the body. The diagnosis of pleural effusion was made on the basis of roentgenological signs and confirmed in almost every case by diagnostic thoracocentesis. In all but one case complete absorption of the fluid occurred. The great majority of effusions occurred in children and young adults and 66 per cent were in males, the remainder in females. In 20 per cent of the cases there was contact with patients with known pulmonary tuberculosis. Adequate follow-up studies were available in only 94 of the 214 cases. Of this final group of 94, 38 developed pulmonary tuberculosis. In 23 of these the pulmonary lesion developed on the same side as the pleural effusion, while in 5 the pulmonary lesions were on the opposite side. Thirteen developed caseous or cavernous pulmonary tuberculosis. Although only 94 of the 214 cases could be satisfactorily followed, a careful search in all local hospitals and tuberculosis sanatoria was made for the remaining patients. Since these individuals could not be found to have been treated in any of these institutions, it is assumed that they were in good health at the time the study was made. It is therefore believed that the incidence of the development of pulmonary tuberculosis in the 214 original cases with idiopathic pleural effusion was 17 per cent. Among the 94 cases that were followed for five years the incidence of the development of pulmonary tuberculosis was 40 per cent.—*Idiopathic Pleural Effusion, C. Schuman, Quart. Bull. Sea View Hosp., October, 1941, 7: 69.—(A. A. E.)*

Mixed Tuberculous Empyema.—The cure of tuberculous empyema with superceded pyogenic infection depends upon the control of the pulmonary tuberculosis and the sterilization and obliteration of the empyema space. In only 54 per cent of patients with tuberculous empyema is the sputum positive. Therefore in most cases surgical treatment may be directed only towards curing the empyema. In all cases of tuberculous empyema with mixed infection a bronchopleural fistula exists whether or not this can be clinically proved. In the presence of a bronchopleural fistula external drainage by means of an intercostal drainage tube is of immediate importance to prevent contralateral spread of the tuberculosis, to reduce toxaemia and to decrease the size of the empyema cavity. Thoracostomy is merely a single step in treatment. As soon after drainage as is reasonably possible an extrapleural thoracoplasty should be done in the usual manner, and this is followed by a Schede thoracoplasty to entirely unroof the remaining cavity. One hundred and twenty-five patients with mixed tuberculous empyema have had surgical treatment. Of these, 39 had only a thoracostomy and all of these patients died; of the remaining 86, 30 had one or more stages of an extrapleural thoracoplasty but died before the Schede thoracoplasty could be done. Of the 56 who had Schede thoracoplasties 10 died, a mortality of 18 per cent. Among the 46 patients who survived the entire operative course, 30 may be considered cured, 15 are still in the hospital and under treatment and one patient has been lost.—*Mixed Infection Tuberculous Empyema, L. R. Davidson, Quart. Bull. Sea View Hosp., July, 1941, 6: 382.—(A. A. E.)*

Bone and Joint Tuberculosis.—Pathology, diagnosis, clinical history and treatment of bone and joint tuberculosis are reviewed and a report on 175 cases is given. In 44 of these cases (25.1 per cent) a definite history of injury was obtained. The age distribution was: under fifteen years, 42; fifteen to thirty years, 88; thirty to fifty years, 40; over fifty years, 5. Ninety-five were males, 80 were females. The locations of the lesions were as follows: cervical spine, 6 cases; thora-

cic spine, 42; lumbar spine, 20; hips, 35; ankles, 23; knees, 19; elbows, 9; sternum, 5; wrists, 4; ribs, 4; foot, 3; sacro-iliac joint, 1. In 7 cases (4 per cent) more than one joint was involved. One hundred and twenty-three (70.3 per cent) came with far-advanced bone tuberculosis and presenting complications most of which are preventable if the disease is diagnosed early and proper treatment given.—*Bone and Joint Tuberculosis: A Review of 175 Cases, R. E. Strain, Indian M. Gaz., October, 1941, 76: 595.*—(*G. C. L.*)

Anal Tuberculosis.—Anal tuberculosis does not occur very frequently unless it is complicated by rectal involvement; and primary tuberculous fistula in ano is scarcely ever seen. It usually occurs secondary to similar disease elsewhere in the body. It spreads by the lymphatics and blood vessels, by direct extension and by sputum laden with bacilli. Autoinoculation may occur. The authors have studied the lesion in 10 male patients whose average age was 36.3 years, and biopsy specimens were obtained in 7 cases. These patients had no rectal tuberculosis and had no evidence of fistula in ano. Pulmonary tuberculosis existed in all 7 cases in which biopsy was performed. Microscopical examination confirmed the diagnosis in 6 of the 7 cases. In the seventh case the microscopical findings were not conclusive of tuberculosis. All of the patients gave a history of pulmonary tuberculosis, and one gave a history of intestinal disease that might have been tuberculous. The histological picture of tuberculosis cutis orificialis was observed in 4 cases. Tuberculosis verrucosa cutis was seen in one case, and a type of haematogenous tuberculosis or sarcoid was observed in another. Anal operations in cases of pulmonary tuberculosis may result in tuberculous infection of the operative wound. Healing often results in anal deformity.—*Anal Tuberculosis, L. A. Buie & M. D. Redding, J. A. M. A., October 4, 1941, 117: 1169.*—(*G. L. L.*)

Cervical Lymphadenitis.—The author reemphasizes the value of roentgen rays in the treatment of tuberculous cervical adenitis and presents statistics to show that such treatment in conjunction with well guided surgery is the most practical remedy for this disease. The early literature also containing encouraging reports of roentgen therapy is cited. The patients included in the present series were treated with the conventional high voltage roentgen ray apparatus, receiving 150 r once every ten days for ten treatments in unilateral disease and 100 r on each side every ten days for ten treatments in bilateral disease. This time-intensity factor precludes any possibility of skin damage even if similar treatment is required six months or a year later. However, second and third repetitions may be dangerous to the skin. The response in most cases was slow, but in some instances it was so rapid that the lesions were hardly palpable after the second or third exposure. Among 87 patients, 77, or 88.5 per cent, were regarded as showing satisfactory results and 10 or 11.5 per cent, were considered unsuccessfully treated. Thirty-nine were Negroes; 37 were white. Ages ranged from twenty-one months to sixty-four years. Both sides of the neck were involved in 32 patients, one side of the neck in 53, the submental region in two. Draining sinuses were present in 22 and all but one were controlled by roentgen treatment. Pulmonary tuberculosis was present in 21 cases. Typical case reports are presented.—*Roentgen Therapy in Tuberculous Lymphadenitis, H. Hauser, Radiology, September, 1941, 37: 304.*—(*G. F. M.*)

Cancer of Lung.—In an attempt to assist in clearing up some of the questions as to the relative or absolute increase in the incidence of primary lung cancer, the cause, the pathological classifications and other factors, the authors sent a questionnaire to the members of the Pacific Northwest Society of Pathologists. An analysis was made of returns reporting 33,945 autopsies over a period of twenty years, in which primary bronchogenic carcinoma appeared 517 times, or an incidence of 1.52 per cent. The twenty years were divided into four five-year periods, and

each of these periods showed a definite increase in the percentage of lung carcinoma as compared with the preceding period. The statistics indicate therefore an absolute increase in the incidence of this condition in recent years. The authors emphasize the aetiological significance of inflammatory processes augmented by various volatile bronchial irritants, such as tobacco smoke, which in combination yields some dozen toxic products of which the nicotine and tar contents are probably most harmful. This theory tends to be confirmed by the striking predominance of bronchogenic carcinoma in men as compared with women. The various gaseous products of industry are also probable aetiological factors. At the University of Oregon Medical School 84 instances of bronchogenic carcinoma were observed in the department of pathology; 78 of the patients were men and 16 women; autopsy was performed in 56 cases. Bronchogenic carcinomata are classified macroscopically into two types, hilar nodular and diffuse necrotic. Histological examination of the neoplasm in the 56 autopsied cases revealed that in 31 it was squamous cell carcinoma, in 13 so-called adenocarcinoma and in 12 reserve cell carcinoma.—*Bronchiogenic Carcinoma, F. R. Menne & M. W. Anderson, J. A. M. A., December 27, 1941, 117: 2215.*—(*G. L. L.*)

Radiation in Cancer of Lung.—The author reports a study of 192 patients with carcinoma of the lung, examined postmortem, of whom 68 had received radiation therapy and 121 were untreated The cases were classified as to histological types, in three groups, 50 being diagnosed adenocarcinoma, 105 epidermoid carcinoma and 37 anaplastic carcinoma. In one third of the cases of epidermoid carcinoma there were no distant metastases, while in those of adenocarcinoma and anaplastic carcinoma there were distant metastases in 92 per cent of the cases. The survival period of irradiated patients was on an average five months longer than that of patients not so treated. Twice as many irradiated as nonirradiated patients survived more than one year. The greater the tumor dose delivered within specified limits, the longer was the survival period. Symptomatic relief was obtained in 45 per cent of the patients. Carcinoma of the lung is an insidious disease, and when the diagnosis is made the disease is usually advanced. Since the general health of the patients is poor, they are often unable to withstand a course of vigorous radiotherapy. However, varyingly satisfactory degrees of palliation can be obtained, and should be sought. The symptoms most frequently relieved in this group were cough, expectoration, haemoptysis and pain in the chest.—*Radiation Therapy in Carcinoma of the Lung, W. V. Tenzel, J. A. M. A., November 22, 1941, 117: 1778.*—(*G. L. L.*)

Cancer of Lung.—Sixty cases of primary carcinoma of the lung have been examined postmortem in the Sea View and Metropolitan Hospitals. Fifty-four of these patients were males and 6 were females. The average age was 54.5 years. Primary carcinoma of the lung originates in the lining epithelium of the bronchi or alveoli. The bronchial epithelium contains four distinct types of cells. These are basal cells, intermediate cells, ciliated cells and goblet cells. In low-grade chronic irritation of the bronchial mucosa transitional changes occur in the epithelium even to the extent of becoming a stratified squamous type. At the Sea View Hospital between 1932 and 1940, 2,000 autopsies were performed and of these 26 cases were found to have primary carcinoma of the lung. Of these 26 patients 15 did not have pulmonary tuberculosis and in the other 11 both carcinoma and tuberculosis were found in the lungs. It is therefore apparent that the chronic irritation of tuberculosis is not an important factor in the production of cancer. There is, in fact, no definite knowledge available concerning the aetiology of primary bronchial neoplasms. There are three distinct types of primary carcinoma of the lung: (*1*) squamous cell carcinoma, (*2*) adenocarcinoma, and (*3*) the undifferentiated form. However, examples of these three distinct

types may often be found in the same tumor and therefore the histological appearance of the lesion is an unsatisfactory basis for classification. Among the 60 cases examined at autopsy all the lobes were involved except the right middle lobe. The most frequently involved lobes were the right lower and the left upper. The classification that seems to have the most logical foundation is based on the position of origin of the tumor. Division may therefore be made into tumors arising from the bronchial tree, with subdivisions of those in the major bronchi, those which originate in the large branch bronchi and those that arise in the smaller branch bronchi. The second class of tumors is those that arise in the alveoli of the lung. The symptoms, physical findings and roentgenological signs of carcinoma of the lung depend upon the bronchus involved and the degree of obstruction which results from the growth of the tumor. A tumor in the bronchus which causes little obstruction will be signified by the symptoms of pain, cough and haemoptysis, with usually few or no changes in physical findings or roentgenograms. In carcinoma of the bronchus which produces partial obstruction the symptoms are cough, pain, haemoptysis, the expectoration of mucopurulent sputum, dyspnoea on exertion, wheezing. The physical findings are those of partial consolidation of the lungs. The roentgenological signs will indicate partial atelectasis of the involved lung. With total obstruction of the bronchus the preceding symptoms will usually be found, together with marked signs of toxaemia and cachexia. The physical and roentgenological findings are those of atelectasis of the lung. Bronchoscopic examination is the most important aid in the diagnosis of primary carcinoma but it must be remembered that failure to find the tumor on bronchoscopic examination does not rule out the diagnosis of bronchial carcinoma. In many cases the tumor is situated in a peripheral bronchus or may not yet have invaded the bronchial mucosa. Metastases may be widespread and are most frequently found in the tracheal, bronchial and mediastinal lymph nodes. In 9 of the cases examined at autopsy no metastases to the neighboring lymph nodes could be found and in 2 of these there were no other apparent metastases. The only suitable treatment is surgical removal of the involved lung. It is important that the diagnosis of carcinoma be made on a basis of the clinical findings and roentgenological signs, since the lesion is often inoperable when a diagnosis can be made by tissue examination. This is particularly true in those tumors that arise in the branch bronchi.—*Primary Carcinoma of the Lungs, G. G. Ornstein & I. G. Epstein, Quart. Bull. Sea View Hosp., October, 1941, 7: 1.*—(*A. A. E.*)

Silicosis in Miners.—Examination was done on 783 workers in three representative Utah mines, extracting lead-copper or lead-silver ores. The dusts contained 20 to 40 per cent free silica; the median diameter of particles was 0.9 micron. Approximately 86 per cent of the workers were exposed to average dust concentrations between 6 and 30 million particles per cu. ft. Silicosis was found in 66 workers (9.1 per cent). The disease developed in 17 per cent of those exposed to dust concentrations greater than 24 million particles, and in 68 per cent of workers exposed to these concentrations for twenty years or more. The prevalence of silicosis in these miners is however lower than in certain other areas where lead ores are mined.—*Silicosis and Other Health Problems of Metal Miners, W. C. Dreesen, R. T. Page & H. P. Brinton, Am. J. Pub. Health, February, 1942, 32: 142.*—(*H. L. I.*)

Cystic Disease of Lung.—In cystic disease of the lung, it is often difficult, due to morphological changes caused by superimposed infection, to ascertain whether or not the condition is congenital. The following case is undoubtedly congenital. A forty-seven year old chauffeur was admitted in status asthmaticus, with a history of asthmatic seizures since childhood. Recently cyanosis had developed. He had had frequent attacks of bronchitis and bronchorrhoea for

ten years. Examination of the chest showed findings typical of asthma. Despite oxygen therapy the patient died one week after admission. Autopsy showed one tremendous bleb in the left lung which hid the anterior surface of the pericardium and extended across to the right side of the chest displacing the mediastinum. Other large bullae were present in the upper lobes of both lungs. Some of these communicated with the bronchi. The left lower lobe showed numerous small cystic areas. The right ventricle was slightly hypertrophied. The walls of the large cysts were formed of relatively avascular connective tissue with scattered elastic fibres. There was no epithelial lining. The parenchyma about the hilum showed collapse of alveoli with purulent exudate in the bronchi, the walls of which were intact. At a distance from the large blebs, atrophy of alveolar walls and diminution of elastic fibres were noted. Capillaries were congested. The small cysts of the left lower lobe were thin-walled, showed no epithelial lining, and were surrounded by atelectatic parenchyma. The arteries showed hyaline degeneration of the media and wide-spread cellular collections in the intima, elevating the endothelium, representing the early stage of atheroma. The congenital origin of this process is indisputable because of the lack of post-natal tissue changes to explain the changes, the extent of the process, its localization to the alveolar system, the alteration of the structure of the alveolar walls and the diminution in elastic tissue so typical of congenital lesions. The basis of the process was probably a congenital deficiency in elastic tissue resulting in congenital emphysema. This is in contrast to an unreported case of Cassinelli, an infant in whom there was a defect in bronchial structure including absence of mucosal glands and deficient development of the muscle and cartilage. In this case an acute emphysema of part of the left upper lobe developed because the bronchus to that area lacked cartilage almost completely. The absence of proper rigid support resulted in a flutter-valve effect. It is to be supposed that multiple cysts would have developed if this infant had lived. Thus it is seen that the same end-result may arise either from defect of alveolar supportive tissue or from deficient bronchial structure. Clinically, these cases must be differentiated from Ayerza's disease. Some of these cases have a long life span. In one case of the author's, the age at death was seventy.—*Quistes gaseosos gigantes y enfermedad poliquística del pulmón, P. Purriel & P. Ferreira Berrutti, Hoja tisiologica, September, 1941, 1: 169.*—(*H. B. S.*)

Pulmonary Syphilis.—A man of thirty years, with a history of chancre and positive Wassermann ten years before, complained of swellings in the neck and supraclavicular area for one and one-half years and dry cough for one year. There was no fever, dyspnoea, dysphagia, asthenia or significant pruritis. He had lost 3 kilograms. Examination showed a number of soft, non-tender, subcutaneous swellings in both supraclavicular and carotid areas, from a few millimeters up to 2 cm. in diameter. Examination of the lungs showed only slight diminution in expansion of the left hemithorax. Blood count showed no anaemia; lymphocytes constituted 48 per cent of a total white cell count of 7,780. One Kahn and two Wassermann tests were negative. X-ray film of the chest showed a piriform shadow about 4 cm. long in the left infraclavicular area, sharp in outline and not connected either with the hilum or with the chest wall. The rest of the lung was entirely normal. Diagnostic pneumothorax caused no alteration in the shadow. Biopsy of one of the masses from the right carotid area showed it to be composed almost entirely of dry yellow necrotic tissue of a precaseous type. The histological picture suggested tuberculosis but syphilis could not be ruled out. Absence of disease in the lung outside the shadow already mentioned, failure of the neck lesions to break down and absence of notable constitutional reaction were all against a tuberculous aetiology. A syphilitic origin was suspected. A course of arsenical therapy caused regression of the swellings in

the neck and progressive clearing of the lung lesion without cavitation, finally leaving only a faint residual shadow, thus substantiating the diagnosis. The diagnosis of syphilis of the lung was made with unwarranted frequency prior to the advent of modern bacteriology. With the discovery of the tubercle bacillus and the better recognition of pulmonary tuberculosis, syphilis of the lung was practically forgotten. Recent publications have brought out the fact that it is by no means a rarity. McIntyre collected 43 cases from the available literature between 1906 and 1920 in which the diagnosis was verified either by autopsy or by the response to therapy. Benda and Friedman have classified pulmonary syphilis as either parenchymatous, bronchial or pleural. The first is subdivided into hyperplastic, gummatous and sclerotic. The hyperplastic lesions are in the form of an interstitial lobular pneumonia. The gummatous lesions may be single or multiple. The sclerotic lesions appear in the form of firm fibrous bands frequently radiating from the hilum along the bronchi and often reaching and invading the pleura. The bronchial lesions consist of bronchial dilatations. The pleural lesions are usually in the form of sclerotic plaques. The case reported is considered to be one of ganglio-pulmonary syphilis, the pulmonary lesion being of the hyperplastic type.—*Consideraciones clínicas sobre un caso de sífilis pulmonar, F. Rebora, Rev. mex. de tuberc., September-October, 1941, 3: 243.*—(*H. B. S.*)

Pulmonary Actinomycosis.—A man twenty-five years of age, presented himself because of productive cough of one year's duration with recent development of haemoptysis and dyspnoea. Examination showed draining sinuses over the upper sternum, the right clavicle and the right scapula. These had been present for a period of several months. Fever and emaciation were noted. There was clinical and X-ray evidence of consolidation of the right upper lobe, with narrowing of the intercostal spaces on that side and deviation of the trachea to the right. Dilated veins over the right lower anterior chest and oedema of the face pointed to obstruction of the superior vena cava. Typical actinomycotic granules were found in the yellowish discharge from the sinuses. A polymorphonuclear leucocytosis was present. Oral administration of sulfanilamide and local application of iodine solution caused disappearance of the fever, diminution of expectoration and closure of the sinuses. But the dyspnoea became worse and a marked tachycardia with irregular rhythm developed, indicating progressive mediastinal involvement. The patient died a few weeks later at home. Autopsy was not performed. Death was attributed to the mediastinal involvement and might have been prevented if treatment had been started earlier.—*Reporte de un caso de actinomicosis pulmonar primitiva con invasion del mediastino, G. S. Madrid, Rev. mex. de tuberc., September-October, 1941, 3: 251.*—(*H. B. S.*)

Pulmonary Infarction.—The syndrome of pulmonary infarction caused by emboli from surgical phlebitis is well known. Frequently patients with nonsurgical diseases have extensive infarction of the lung that was not discovered during life. A survey of necropsy and clinical records of Northwestern University has been made. This covered 1,311 necropsies performed in a six-year period and included 101 cases with gross pulmonary infarction. The incidence of 7.7 per cent is similar to that reported by others. Among 234 cases the principle cause of death was heart disease and in this group pulmonary infarction was found 81 times, 35 per cent, yet a clinical diagnosis of this complication was made only twice. This is probably because the symptoms of pulmonary infarction are very similar to those of heart failure. Such symptoms as haemoptysis, pleural pain, cough, dyspnoea, cyanosis, fever and pulmonary râles are common to both diseases. Only minor differences in the incidence of these symptoms have been found in the two groups, with the exception of haemoptysis which occurred in 35 per cent of the patients

with infarction but in only 8 per cent of those with heart disease without infarction. Persistent recurrent haemoptysis is a distinctive feature of the disease. There was a higher incidence of pulmonary infarction in bacterial endocarditis but there was little difference in the incidence among those with rheumatic, vascular or syphilitic heart disease. The lower lobes were most commonly involved. Emboli large enough to occlude the pulmonary artery or main branches cause symptoms and produce signs very similar to those of coronary thrombosis but it is usually possible to make a clinical differentiation. Smaller emboli which occlude secondary and tertiary branches of the pulmonary artery produce haemorrhagic infarcts and a syndrome characterized by sharp pleuritic pain in the lower chest, dyspnoea, haemoptysis, mental anxiety, mild shock, rapid pulse, fever, pulmonary consolidation and friction rub. In postoperative patients such a syndrome is sufficiently characteristic to allow immediate diagnosis of pulmonary embolus; however, in patients with heart failure these same signs and symptoms are common with and without pulmonary infarction. In the management of heart disease the frequent occurrence of this complication should be kept in mind. Infarction of the lung should be considered if the patient has persistent or recurrent haemoptysis, persistent deep cyanosis, unexplained fever, unexplained jaundice or sudden onset of heart failure not caused by overexertion or infection.—*Pulmonary Infarction in Heart Disease, L. E. Hines & J. T. Hunt, Ann. Int. Med., October, 1941, 15: 644.*—(*A. A. E.*)

Pneumonia.—During the past four years smears of rusty sputum from patients with pneumococcic pneumonia have been studied with Wright's stain in an effort to obtain information concerning the pneumonic process in the lungs of individual cases. It has been found that the number of extracellular encapsulated pneumococci in rusty or bloody sputum gave a reliable index of the severity of the pneumonic process. There is a definite correlation between the number of pneumococci per oil immersion field and clinical factors which are usually regarded as true indications of the severity of the infection. As the number of pneumococci per field increased there was a corresponding rise in the mortality rate, an increase in the incidence of bacteraemia and multiple lobe involvement. If the pneumococcus count in the sputum exceeded 50 per oil immersion field the prognosis was usually grave regardless of what form of treatment was used. Within eight to thirty-six hours after the intravenous injection of specific horse or rabbit serum the pneumococci in the sputum were found to be agglutinated and in many cases increased phagocytosis of the organisms was demonstrable. Occasionally specimens of sputum from patients who had not received treatment contained pneumococci which were already agglutinated. It is believed that this represents a developing active immunity on the part of the patient. Within twelve to thirty-six hours after the administration of sulfonamides the number of pneumococci per field in the sputum decreased rapidly. This was independent of the agglutination and phagocytosis associated with active or passive immunity. Two hundred and seventy proved cases of pneumococcus pneumonia caused by Types I, II, IV, V, VII and VIII have been studied by means of sputum counts. In this group treatment has been carried out according to the number of pneumococci found per oil immersion field and the duration of the disease. The treatment selected for individual cases was based on these factors: When there were 10 or less pneumococci per field without clumping and the patient was in the fourth or later day of the disease, no specific treatment was given. Under the same circumstances, if the patient was first seen within the first three days of the disease antipneumococcic serum was given. With 11 to 50 pneumococci per field sulfapyridine or sulfathiazole was administered regardless of the day of the disease or the presence of clumping of pneumococci in the sputum. If 50 or more pneumococci were found per field chemotherapy and serum therapy in combination were

used. Forty-eight patients had no specific therapy based on the previous criteria. Of this group none died and although the clinical course in many of these cases was not dramatic all made a satisfactory recovery. Seventy patients who had been ill less than four days and in whom sputum studies showed a relatively mild infection (10 or less pneumococci per field) were treated by the administration of type specific serum. It was believed that these patients had not been ill long enough to develop active immunity and that therefore specific serum was indicated. Among these the average dose of serum was 35,000 units and in this group there were no deaths. Chemotherapy was used in those patients who were moderately or severely ill (11 to 50 pneumococci per field). The status of the immune mechanism was not considered because of its relative inefficiency in patients with large numbers of pneumococci in the sputum. There were 114 patients in this group and of these 7 (6 per cent) died despite the fact that 40 per cent had bacteraemia. Those patients with sputum counts exceeding 50 per oil immersion field were thought to be potentially overwhelmed by their infection. Although only 24 patients were placed in this group, 79 per cent had bacteraemia and 88 per cent had multiple lobe involvement. All of the patients in the latter group were treated by combination of type-specific serum and sulfapyridine or sulfathiazole. Fourteen, 58 per cent, died. The average amount of serum given was 323,000 units. Most clinical trials of therapeutic agents in pneumonia have been based primarily on the method of alternate case selection. This method fails to take into consideration those cases which would survive under any form of treatment and usually discards the severely ill patients who die shortly after admission to the hospital. By the method of sputum examination cases may be classified in prognosis groups, thereby permitting a true comparison of the efficacy of various therapeutic agents. It is also believed that sputum counts provide a method of recognizing severely ill patients on admission to the hospital so that combined serum and chemotherapy may be immediately used. Sputum examinations of this type are of value in determining whether or not chemotherapy is producing the desired bacteriostatic effect and in the detection of cases in which the pneumococci have become resistant to the drugs.—*Sputum Studies in Pneumonia: The Selection of Therapy, A. W. Frisch & A. E. Price, Ann. Int. Med., December, 1941, 15: 987.*—(*A. A. E.*)

Influenza.—Investigations of influenza are difficult since acute upper respiratory diseases closely resemble each other and clinical differentiation is not always possible. Epidemicity is almost the only characteristic which aids in the differentiation of influenza from other respiratory diseases. A further difficulty in the study of influenza is the lack of a suitable experimental animal. Ferrets and hamsters are the only known species which are sufficiently susceptible to infection by human viruses to be useful in experimental work. Despite these difficulties two of the causes of influenza have been discovered and are known to be viruses. These are influenza-A virus and influenza-B virus. More than 850 cases of influenza have been studied in the Laboratories of The Rockefeller Foundation and of this number 30 per cent were caused by unidentified strains of the viruses. One of the most important problems in the study of the disease is that of immunity, since there are no therapeutic agents which significantly affect the course of the disease. Measurements of the quantity of circulating antibodies against influenza-A virus have been made in over 1,300 apparently normal persons living in areas in which epidemics of influenza had not occurred for at least two years. In this group 20 per cent of adults had very small quantities of antibodies, another 20 per cent had large amounts and the remainder had circulating antibodies in various titers. A considerable number of cases of influenza-A occurred in persons with low antibody levels and few cases of the disease occurred in persons with high antibody levels.

The high antibody levels achieved during convalescence decrease rather rapidly following recovery from the disease. One attack of influenza-A apparently did not result in an enduring immunity and at least 60 per cent of the cases studied could have been reinfected by the same virus within one year of their illness. Parenteral injection of active or inactivated influenza-A virus stimulated the production of specific antibodies. A vaccine was prepared from chick antibodies inoculated with influenza-A virus and the X-strain of canine distemper virus. Large groups of persons in various institutions were given a single subcutaneous injection of this vaccine and similar groups were left as unvaccinated controls. Four months after the vaccine had been given outbreaks of influenza occurred in a number of these institutions. A decrease of approximately 50 per cent in the incidence of the disease was observed among the vaccinated groups. It is believed that a satisfactory and trustworthy immunizing agent against influenza-A has been found.—*Influenza, F. L. Horsfall, Ann. Int. Med., November, 1941, 15: 811.*—(*A. A. E.*)

Cough with Mitral Stenosis.—In most cases of mitral stenosis with cardiac failure cough is one of a number of symptoms. In only a few does it overshadow all other symptoms. In some cases it may be due to chronic congestive bronchitis. The patient studied was a fifty-two year old woman whose chief complaint was that of severe paroxysmal cough. These attacks of cough were more frequent at night and were sometimes accompanied by the expectoration of thick tenacious mucus. Upon examination the patient was found to have rheumatic heart disease with mitral stenosis and auricular fibrillation. Eventually she died of cardiac failure and postmortem examination was carried out. The heart was found to be greatly enlarged as a result of marked dilatation and hypertrophy of the auricles and the right ventricle. The tracheobronchial angle measured approximately 135 degrees, which is considerably greater than normal. This was caused by the dilatation and hypertrophy of the left auricle. Very little intrinsic pulmonary disease could be found. Enlargement of the left auricle by pressure upon neighboring structures may cause a number of secondary effects. (*1*) The upward displacement of the left main bronchus and pulmonary artery may compress the left recurrent laryngeal nerve resulting in paralysis of the left vocal cord. (*2*) Compression of the esophagus in the middle portion of its course behind the left auricle may cause dysphagia. (*3*) The chief effect of dilatation of the left auricle is compression of the left main bronchus and widening of the tracheobronchial angle as reported in this case. The usual tracheobronchial angle is 50 to 85 degrees. As the angle becomes wider, the bronchi, and particularly the left, may be considerably compressed and this mechanical irritation may cause severe cough. In the present case cough was known to have been present for over six years and was not associated with pulmonary disease. In this patient also a thrombus was found in the upper portion of the left auricle. This thrombus was very hard and it is probable that it increased the local pressure upon the overlying bronchus. —*Long-Standing Productive Cough as Chief Clinical Manifestation in Mitral Stenosis; A Case Complicated by Thrombosis of Left Auricle, Estelle E. Kleiber, Ann. Int. Med., November, 1941, 15: 899.*—(*A. A. E.*)

Blast Effects.—The physiological effects of blast were studied in a series of animal experiments. By using plaster or steel casts to protect various regions of the rabbit's body, such as the trunk or the abdomen, while the rest of the body was exposed to high blast pressures it was possible to show that the cephalic or thoracic or abdominal injuries resulting from the blast are due to the wave acting directly on the exposed surface of the body and not to either the pressure or the suction components of the wave acting through the nasal or oral passages. The protected areas showed little, if any, tissue damage whereas the exposed areas were severely

damaged. Electrocardiographic records showed no change in the conduction mechanism but a marked fall in cardiac rate and amplitude of electrical deflection when the blast pressure was high enough to cause immediate death. These latter cardiac effects were ascribed, in part, to the abrupt cessation of the circulation by severence of the abdominal aorta and inferior vena cava and were reduplicated by severing these vessels. Animals which survived exposure to blast showed, at times, evidences of transitory anoxaemia and when unanaesthetized frequently revealed accelerated heart rates. The arterial blood pressure fell immediately after exposure to blast and, in the one animal tested, was associated with a slight maintained fall in venous pressure suggesting a state of shock. In the unprotected, completely exposed rabbits the fall in arterial blood pressure to shock levels was due primarily to changes in the pulmonary blood flow. In severely blasted animals the presence of pulmonary oedema, right heart dilatation and hydrothorax implied an increase in pulmonary arterial pressure due to reduction in the reserve capillary bed such as is seen after the experimental obstruction of the pulmonary circuit by the intravenous injection of starch. The respiration of rabbits which survived blast exposure was very rapid and shallow and these changes were apparently due to increased stimulation of the nerve endings by local lesions in the lung tissue rather than to chemical changes affecting the respiratory centre or to any direct effect on the medulla. When the lung was severely damaged and its lobes consolidated, the respirations were slow and labored. Electrocorticograms taken during and after exposure to blast usually revealed no changes or changes which could be related to cortical anoxaemia resulting from general circulatory changes. Concussions did not occur. The mode of death when unassociated with external trauma appears to be shock following internal injury. At times asphyxia due to occlusion of the major air-passages by blood clot was responsible for death. In delayed death, pulmonary oedema, or rarely intraperitoneal haemorrhage, was the rule. Changes in the cardiac and nervous systems were never directly responsible for fatalities. Certain clinical implications are discussed. Treatment is directed to avoid overtaxing an already diminished pulmonary capillary reserve. Oxygen, morphine and venesection may be beneficial while transfusion, general anaesthesia and exertion are contraindicated because they tend to increase the venous return and pulmonary congestion with consequent production of pulmonary oedema.—*Physiological Effects of Blast*, *P. L. Krohn, D. Whitteridge & S. Zuckerman*, *Lancet*, *February 28, 1942, 1: 252.*—(*J. B.*)

Acute Empyema.—Since 1929 at the Sinai Hospital 33 cases of acute empyema have been treated by tidal irrigation and suction according to the method described by Hart. In 4 of these cases tidal drainage was ineffective and was followed later by rib resection for drainage. Of the 33 patients treated, 6 died (18 per cent) and all deaths occurred in those patients treated by tidal irrigation alone. In 3 cases death was caused by acute purulent pericarditis, associated in one with acute peritonitis. At postmortem examination the empyema cavities were almost entirely clear. Two infants were almost moribund when admitted to the Hospital and their toxaemia could not be relieved. The sixth death occurred in an eight year old child with unilateral empyema and bilateral pneumonia involving all lobes. All the patients who died were under the age of twelve and 4 were less than two years of age. Pneumococcus was the causative organism in 25 cases, haemolytic streptococcus in 2, staphylococcus albus in one, and staphylococcus aureus in one. All 6 of the deaths occurred in patients with pneumococcus empyema. The major indications for tidal drainage were as follows: Condition too poor for rib resection in 4 patients; streptococcal empyema in 2; synpneumonic empyema in 12; bilateral empyema in 3; bronchopleural fistula in 4; and septicaemia with synpneumonic empyema in 4. Tidal irrigation works equally well in the presence

of thick or thin pus provided meticulous attention is paid to the management of the irrigating system. It may also be used satisfactorily in the presence of bronchopleural fistula. None of the patients treated by tidal drainage alone developed chronic empyema or a persistently draining sinus, but 4 of the patients required subsequent open drainage.—*The Treatment of Acute Empyema; Treatment by Continuous Tidal Irrigation and Suction (Hart), B. Klotz & B. Lidman, Ann. Int. Med., December, 1941, 15: 974.*—(*A. A. E.*)

Sulfanilamide in Pleural Fluid.—Little attention has been paid to the passage of sulfanilamide into fluids of inflammatory origin. Five patients with acute tuberculous pleural effusion were studied; in four of these, the diagnosis was proved by the presence of tubercle bacilli and in the fifth, the clinical course was that of a tuberculous effusion although the bacilli were not found. In addition, one patient with acute and one with chronic inflammatory joint disease were observed. Sulfanilamide was given in a large initial dose, 4 or 5 g., and in doses of 1 to 1.3 g. at four hour intervals thereafter. In all cases, the pleural fluid was found to contain at some time an amount of sulfanilamide much greater than that in the blood. For example, at the same time, one patient had a blood level of 7.1 mg. and a pleural fluid level of 133.3 mg. The marked concentration of the drug in the pleural fluid occurred rather rapidly; in some patients, this occurred within one hour after first administration of the drug. In 2 of the patients, in whom the concentration of sulfanilamide in the pleural fluid quickly reached high levels, the blood level of the drug was only about half that usually found after the amount of drug which was given. Apparently, large inflammatory exudates may prevent the attainment of a desirable blood level. Since sulfanilamide tends to become selectively concentrated in inflammatory fluids, it may be that much smaller amounts of the drug than usually employed would be effective for these fluids. The pleural fluid level of the drug remained high for periods up to three weeks and as long as two to three weeks after discontinuation of the drug. From these studies, it is also evident that the large amounts of the drug in the pleural fluid may serve as the source from which the blood level may again reach a considerable figure. Therefore, the possibility of reabsorption from exudates must be considered with reference to continued or renewed administration of the drug. This again emphasizes the importance of frequent estimations of the blood level during therapy. In the patient with acute joint inflammation, most probably of gonococcic origin, similar results were obtained. In the patient with chronic joint inflammation, however, the blood and joint fluid levels were practically identical. This was probably due to the fact that the capillary permeability, increased in acute inflammation, had returned to normal. These results point to the possibility of attaining high concentrations of the drug in inflamed areas without the same high level in the blood and thus decreasing the number of toxic reactions. This would not apply, of course, in cases of sepsis.—*Effect of Inflammation on the Concentration of Sulfanilamide in Pleural and Joint Fluids, R. Gregory, Arch. Int. Med., March, 1942, 69: 429.*—(*H. R. N.*)

Spontaneous Haemopneumothorax.—Judging by the number of case reports, spontaneous haemopneumothorax is a rare condition. In the case observed a total of 1,400 cc. of blood was removed from the pleural cavity. The onset of the condition was abrupt and could not be associated with trauma or other disease. The probable mechanism of production was the rupture of an emphysematous vesicle followed by the tearing of pleural adhesions which contained blood vessels. The patient presented the symptoms of spontaneous pneumothorax with the added symptoms of haemorrhage and mild surgical shock. The treatment was confined to the occasional aspiration of sufficient quantities of blood to relieve the patient's dyspnoea. Within two months roentgenograms of the chest

showed almost complete resolution and a subsequent roentgenogram three months later showed completely normal lung fields. The sedimentation rate which was rapid at first gradually returned to normal as the amount of blood in the pleural cavity became less. It is suggested that serial observations of the sedimentation rate would be useful in determining the approximate amount of blood in the pleural cavity.—*Spontaneous Hemopneumothorax; Report of a Case, D. Snively, H. Shuman & W. D. Snively, Ann. Int. Med., February, 1942, 16: 349.*—(*A. A. E.*)

Isolation of Coccidioides.—In the San Carlos area, Arizona, coccidioides has been isolated from soil and from rodents but has not yet been demonstrated from a human case. The soil was not heavily infected. Small rodents appear to constitute an important natural reservoir of this fungus.—*Isolation of Coccidioides from Soil and Rodents, C. W. Emmons, Pub. Health Rep., January 23, 1942, 57: 109.*—(*A. B. T.*)

Addison's Disease.—Since the treatment of Addison's disease has been modified periodically it is well to evaluate the results obtained. Forty-three patients seen at the Mayo Clinic between October, 1933 and July, 1937 were previously reported by Rynearson *et al.*; Hampton and Kepler now present data on 67 additional cases seen between July, 1937 and December, 1940 with an analysis of the results obtained in the two groups. Evidence of either active or arrested tuberculosis was present in 34 per cent of these 110 cases. Atrophy was presumed to be the aetiological factor in the majority of the remainder. An associated disease that might have influenced the mortality and the degree of morbidity was present in 41 cases. Nineteen patients refused to adhere to the low potassium diet and serve as controls in this study. Fifty-three per cent of this latter group lived more than one year and only 18 per cent were alive at the end of four years in contrast to those treated with low potassium diet, 88 per cent of whom lived more than one year and 40 per cent of whom lived more than four years. Of 23 patients who died while treated with low potassium diet, 11 died in crises. The other deaths occurred as the result of an associated complication. However, 18 patients are still being sustained by a low potassium diet, sodium chloride and sodium citrate. Only 3 require cortical extract regularly and the remainder use it only during periods of stress. Of these 18 patients, 8 are able to work all year at their regular occupation, 2 are able to work except during very hot weather, 7 are working part time and one is unable to work at all. Fourteen patients previously maintained on a low potassium diet were later given daily injections of desoxycorticosterone acetate and the low potassium diet was discontinued. Marked improvement followed so that 12 are able to carry on normal activities. Nine patients were treated with low potassium diet, high sodium salts and desoxycorticosterone acetate. The results were very poor for only one patient remained well; 5 died within two months. Clinical and chemical evidence indicated that excessive sodium and water were being retained. The treatment was then modified so that each patient given desoxycorticosterone acetate was also given a diet containing the amount of potassium present in the average diet. Sodium citrate was discontinued. Thirty-two patients have been on this regimen. There has been one fatality. Sixteen are well and able to work every day, 10 are able to work most of the time, while 5 are able to work occasionally. All these patients receive 2 to 5 mg. of desoxycorticosterone acetate and also receive 2 to 5 g. of table salt daily. Liberal eating and a meal at bed-time are advised. When unable to eat, supplementary potassium may be given in the form of potassium chloride. The administration of large amounts of cortical extract and intravenous saline to which sodium citrate has been added is the treatment of choice for Addisonian crisis. Cortical extract may be used in conjunction with desoxycorticosterone acetate during periods of infection. Stress is placed on the fact that when the patient reaches a more

normal physiological state the dose of desoxycorticosterone acetate should be reduced and also on the fact that the appearance of oedema, rising blood pressure to hypertensive levels and evidence of mounting venous pressure are danger signals requiring a decrease in both sodium chloride and desoxycorticosterone acetate. Thus good results may be obtained by the use of desoxycorticosterone acetate and unrestricted diet. If the patient is unable to take this low potassium diet then high intake of sodium salts may be used but the two types of treatment should not be combined.—*Addison's Disease: Treatment and Prognosis, H. P. Hampton & E. J. Kepler, Am. J. M. Sc., August, 1941, 202: 264.*—(*G. F. M.*)

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